

MCF 3M Opener

A ball is tossed upward from a cliff. The height of the ball above the water is modelled by $h(t) = -5t^2 + 10t + 40$ where $h(t)$ is the height in metres and t is time in seconds.

- a) What is the maximum height reached by the ball? *vertex*
 b) When does the ball hit the ground? *zeros*

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MCF 3M Opener

$$h(t) = -5t^2 + 10t + 40$$

a) What is the maximum height reached by the ball?

$$h(t) = -5(t^2 - 2t - 8)$$

$$h(t) = -5(t+2)(t-4)$$

vertex

$$\begin{aligned} \frac{4+2}{2} &= \frac{6}{2} = 3 \\ -5(3+2)(3-4) &= -5(5)(-1) = 25 \end{aligned}$$

When does the ball hit the ground?

At 4 sec the ball hits the ground.

$$\begin{aligned} h(t) &= -5(t-4)(t+2) \\ &= -5(4-4)(4+2) \\ &= -5(0)(6) \\ &= 0 \end{aligned}$$

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3.4 Solve by Factoring

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zeros - x-intercepts

x values where graph crosses x axis
 $y = 0$

roots - solution for a value
 sometimes 0 but can be any value

Mar 6-8:00 AM

Solve $a(x-s)(x-t) = 0$

i) $(x+7)(x-3) = 0$ ii) $0 = (2x-1)(3x+5)$
 $(x+7) = 0 \quad x = -7$ $(2x-1) = 0 \quad x = \frac{1}{2}$
 $(x-3) = 0 \quad x = 3$ $(3x+5) = 0 \quad x = -\frac{5}{3}$

iii) $2x^2 + x - 15 = 0$ iv) $12x^2 = x + 6$
 $2x^2 + 6x - 5x - 15 = 0$ $12x^2 - x - 6 = 0$
 $2x(x+3) - 5(x+3) = 0$ $12x^2 - 9x + 2x - 6 = 0$
 $(x+3)(2x-5) = 0$ $3x(4x-3) + 2(4x-3) = 0$
 $-3 \quad +\frac{5}{2}$ $(4x-3)(3x+2) = 0$
 $\frac{3}{4} \quad -\frac{2}{3}$

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p161-162
 21, 2ac, 3b, 4ac, 5ac
 6ac, 7ac, 8

$$(2x)(x-3)$$

$$\begin{aligned} 2x &= 0 & x-3 &= 0 \\ 0 & & 3 & \end{aligned}$$

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3b)

$$2x^2 - 5x - 35 = 0$$

$x = -4$
 is a root

$$2(-4)^2 - 5(-4) - 35 = 0$$

$$2(16) + 20 - 35 = 0$$

$$32 + 20 - 35 = 0$$

$$52 - 35 = 0$$

$$17 = 0$$

$$LS \neq RS$$

Proofs

Oct 5-10:30 AM

$$\begin{aligned} 2x^2 - 9x - 5 &= 0 \\ 2x^2 - 10x + 1x - 5 &= 0 \\ 2x(x-5) + 1(x-5) &= 0 \\ (x-5)(2x+1) &= 0 \\ 5 & \quad -\frac{1}{2} \end{aligned}$$

A/M
-9 | -10
^
-10 +1

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